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ABSTRACT

This document describes a summer program for newly-graduated high school students interested in a science and/or engineering career. One purpose of the program was to strengthen skills in mathematics, science, and reading for students prior to college entrance. Students could earn up to eight semester hours of credit. Results of the program indicated that students who completed the program became strongly motivated towards science and/or engineering careers. Many of the participants were enrolled in programs reflecting this motivation. This report presents the testing and evaluation research conducted. (MA)

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A STUDY OF THE ROWLAND SCHOLAR PROGRAM AT CLARK COLLEGE

O. P. Puri
Director

1976

Clark College
Division of Natural Science and Mathematics
Atlanta Georgia 30314

SE 025 134

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ACKNOWLEDGMENTS

The successful operation of a program of this size and scope requires the concentration and energy of a number of skilled professionals.

This report would probably never be completed without the continuous encouragement, help, and intellectual contributions of all faculty and staff involved in the development and implementation of the Rowland scholar Program. We wish to thank all, including our scholars who participated in this study and successfully completed the entire eight week program.

We owe special thanks to Dr. Edwin H. Land, President of the Rowland Foundation Inc., for making a generous contribution of shares of Polaroid Corporation stocks. This grant,has contributed greatly to the improvement of our academic ventures and it is hoped that Dr. Land will continue his interest in our institution. We, at Clark College, wish to express our sincere gratitude to Dr. Land whose thoughtfulness and generous support was significant and timely.

The goals and achievements of the Rowland Scholar Program cannot be told in terms of statistics alone. Essentially, the story is one of Edwin Land reflecting his warm, honest, and constructive interest in affording the opportunity for young people to develop in the field of Science and Engineering.

Finally, we would like to express our sincere thanks to the supporting staff in the offices of the Registrar, Financial Aid, Business, and Food Services.

Om P. Puri

INTRODUCTION

The Division of Natural Sciences and Mathematics at Clark College has conducted an eight week 1976 summer program for forty-five selected students interested in a science and/or engineering profession. This program was inaugurated to strengthen skills in the area of mathematics, science, and reading. In addition, the participants were introduced to courses in computer science and scientific instrumentation. Participants were given the option to earn up to eight (8) semester hours of credit in the program. After completion of the summer program, the participants joined their fellow freshmen in beginning their matriculation. The program was implemented October 1, 1975, and was directed by Dr. O. P. Puri, Garfield D. Merner Professor of Science and Chairman of the Physics Department.

The students who completed our program became strongly motivated towards careers in science and/or engineering. Some of our students are enrolled in the college's Honors Program; others are enrolled in the Dual-Degree Engineering Program; while others are pursuing careers in Allied Health and the pure sciences.

One of the goals of this program was to develop and test mechanisms for stimulating the entrance of qualified minority students in the sciences and engineering. In attempting to achieve this goal, several components were considered to be crucial. If these components were

missing in a students' experience, it was hypothesized that the student would have a lower probability of choosing science and/or engineering as a career than a student whose experience contained them.

Several faculty members from the college were assigned to conduct this program which included the following activities in addition to the academic program previously stated.

1. Discussion of career opportunities in the field of science and engineering.
2. Industry and laboratory tours which gave students first hand knowledge of practices in various fields.
3. Guidance sessions which covered concepts on how to study, use of the library, how to take tests, and how to get along in college.

These activities provided a variety of experiences which we feel are essential to the eventual pursuit of a career in either science or engineering. In our recruitment efforts, we utilized some techniques that have proven to be highly effective in the special efforts we employed in increasing the number of Clark students preparing for careers in Journalism, Pharmacy, and other health related professions. First, we identified a group of high school students, primarily in the Atlanta and Southeastern area, that demonstrated strength in science instruction. Members of our science faculty established direct contact with the science teachers in these various schools. (while we did not overlook the role of high school guidance counselors and our own college recruiters, it was our intention to narrow the focus or efforts in much more than was generally possible in the more traditional approaches.) Clark College

already has access to a good pool of science teachers who have attended summer training institutes on our campus. These teachers were encouraged to work closely with us in identifying good or potentially good science students and encourage them to apply for admission to Clark College and to seek enrollment in the pre-freshman summer program.

Because there was an element of experimentation in the program, particularly during this first summer, evaluation of our efforts was extremely important. The program met the following evaluation objectives.

1. Designed and implemented an instrument to measure the overall effectiveness of this program. Did the program in fact lead to increased interest and participation in science and engineering fields?

2. Designed and implemented an instrument for the relative effectiveness of the programs' components. Could an increase in interest be attributed to the summer programs' components?

3. The time, efforts and costs associated with this program and its justification.

A comparision between the performance of the students exposed to the pre-freshman summer program and those who did not enter college via that route will be made at the end of the 1976-77 academic year.

Under the auspices of this program, a stipend was provided for each student covering his/her expenses for the entire eight weeks which included room, board, and a weekly stipend of $25.00. Further-

more, we awarded year-round scholarships to successful participants in order for them to complete their undergraduate work at Clark College. The summer program commenced June 21, 1976 and terminated August 13, 1976.

This program was made possible through a grant in the amount of $140,000.00 over a period of two years from the Rowland Foundation.

TESTING AND EVALUATION

Dr. Carson Lee

CLARK COLLEGE
ATLANTA, GEORGIA

THE TESTING/EVALUATION COMPONENT OF THE SUMMER PROGRAM FOR ROWLAND SCHOLARS IN SCIENCE AND ENGINEERING

The testing component for the summer program for Rowland Scholars in Science and Engineering was divided into two categories: those tests to be used systematically and those for special uses. The first category was composed of achievement tests in subject matter areas. The interest and the personality inventories were the ones composing the special uses category. In order to determine the effectiveness of the eight-week academic experience, the participants were administered tests prior to and immediately following the eight-week activity. To further determine the impact of the experience, the subjects will be given tests at various intervals during the years they are in college. A major effort will also be made by the program to compare the test and college performance of the Rowland Scholar participants with a control group selected from the regular student body. In addition, the testing component was designed to have the scores made on the various instruments by the subject interpreted to him during the eight-week summer program.

SOURCES AND NATURE OF DATA

Inasmuch as test information was needed from the subjects both before and after they had participated in the eight-week experience, different forms of the same tests were administered to the subjects during the two test administrations. A categorical description of the tests used follows:

Iowa Silent Reading Test. The Iowa Silent Reading Tests - Form E was administered to each of the forty-five Rowland Scholar participants at the time of their entrance into the program as well as after they had matriculated in the program for eight weeks. This examination has three parts: a section called vocabulary which deals with the ability to understand words, a section entitled Reading Comprehension which deals with the ability to understand written material, and a Reading Efficiency section which deals with how fast one reads.

California Language Achievement Tests. Since a substantial number of students entering college have some difficulty in English, the California Language Tests were given to the subjects before and after they had participated in the summer program. This examination has two parts: a section dealing with mechanics of English and a section which deals with sentence structure and usage.

Sequential Tests of Educational Progress Mathematics Computation Test - Form 2A & 2B. This instrument is designed to measure the student's ability to solve operations involving whole numbers, fractions, decimals and percents, denominate numbers, and algebraic manipulation.

Sequential Tests of Educational Progress Mathematics Basic Concepts Forms IA & IB. The subjects were administered this test before and after the summer experience to determine the effectiveness of the program and to determine the subjects' understanding of basic mathematical notations and fundamental concepts in number operation, geometry - measurement - logic - proof, algebraic relations, application, and probability statistics.

Sequential Tests of Educational Progress Science Test - Forms A & B. To determine knowledge and understanding in the natural sciences and to determine the effectiveness of the program, the STEP General Science Test was administered to the students prior to and at the end of the summer program.

This device consists of two parts. Part I and Part II of this test consists of multiple choice items concerning knowledge, comprehension, and application of terms and concepts of elementary biology, chemistry, physics, and earth sciences. In addition, Part II includes items dealing with the use of higher abilities in the understanding of biology, physics, and the earth sciences.

Kuder Occupational Interest Inventory. In order to assist the participants with the vocational decision making process the Kuder Occupational Interest Inventory was administered and interpreted to each subject in the program.

Mooney Problem Check List. To assist in counseling the students regarding some of their personal concerns, the Mooney Problem Check List was administered to each subject. This instrument is a list of troublesome problems which often face students in college.

College Entrance Examination Board Scholastic Aptitude Test. The Rowland Scholars took the SAT prior to admission to the program. This test measures the verbal and mathematical reasoning abilities that a student has developed over the years. It is an admission test that allows the student to compare himself in these areas with other college bound students taking the test at the same time or with students already enrolled in various colleges.

The Undergraduate Program Area Tests. In order to determine the Rowland Scholar participants general knowledge in the humanities, natural science, and social science, they were given the Undergraduate Program Area Tests prior to their participation in the eight-week summer experience. The subjects will take these tests again during their senior year in college to evaluate growth in the three areas. A comparison will also be made between the achievement made in the three areas by the Rowland Scholars and the achievement made by a control group of regular college students.

According to Educational Testing Service, the sixty-minute Area Tests, reported on a 200-910 scale, measure general knowledge in the three areas mentioned above. Further, they measure the student's ability to grasp and apply basic concepts in the three areas. They are suitable in difficulty for a wide range of student abilities and may be administered at any college level. Given to freshmen upon entering college, the tests serve to evaluate previous learning and establish baselines for institutional longitudinal studies.

TEST INTERPRETATION AND COUNSELING

Since a major objective of the Rowland Scholar Program was to assist the participants in understanding their performance on the standardized test instruments administered at entrance into the program, the scores made on these instruments by the participants were interpreted to each of them during the eight-week period. In addition to the test interpretation, the participants received counseling regarding the perceived problems indicated in the counseling inventory.

The test interpreter/counselor was available to the student during the day when he was not in his/her academic classes. During the session with the counselor, the student was assured that whatever was said would be completely confidential and would have no effect on his/her status in the program.

ANALYSIS OF THE DATA

In the analysis of the test data, the change in test performance was considered for all Rowland Scholar participants. That is, a test of significance was made between the group mean raw scores of the subjects on the STEP Mathematics Basic Concepts, STEP Mathematics Computation, STEP Science, California Language Tests, the Iowa Silent Reading Tests, and the Mooney Problem Check List before and after the eight-week experience. In addition,

statistical information about high school grades, SAT scores, UGRE scores, and vocational interest was summarized and is presented in tabular form in this report.

Because of the different levels of achievement of the students at entrance into the program in reading and English, a decision was made to require nineteen of the subjects to take the English course and eighteen to take the reading. In order to determine whether the students taking the reading/English course moved closer to the performance of the students not taking the course, a comparison was made between the difference in performance on tests in the subject areas by the two groups before and after the eight weeks of instruction.

VOCATIONAL INTEREST, SAT, AND HIGH SCHOOL GRADE DATA ON ROWLAND SCHOLAR PARTICIPANTS

Results from the Kuder Occupational Interest Survey, Scholastic Aptitude Tests, and Record of High School Achievement are presented in Tables I, II, III. The distributions of SAT scores and high school grades of participants appears in Table 1, and the distributions according to occupational interest in Tables 2 and 3. Table 2 presents interest pattern information for the male participants and Table 3 presents interest pattern information for the female participants.

Table 1- The Scholastic Aptitude Test Scores and High School Grade Point Average for the Rowland Scholar participants.

Student	H.S.G.P.A.	SAT (V)	SAT (M)	SAT (TOTAL)
1.	2.78	300	310	610
2.	3.0	560	540	1100
3.	3.11	380	280	660
4.	3.33	480	450	930
5.	3.01	390	430	820
6.	3.16	440	500	940
7.	3.32	18 (Act)		
8.	3.27	420	490	910
9.	3.2	410	430	840
10.		370	480	850
11.	3.9	470	430	900
12.	3.45	370	330	700
13.	2.0	200	350	550
14.	3.16	310	400	710
15.	3.9	400	380	780
16.	2.64	290	340	630
17.	3.27	440	400	840
18.	4.0	460	600	1060
19.	2.07	310	380	690
20.	2.5	490	440	930
21.	2.64	430	440	870
22.	3.27	330	460	790
23.	3.67	400	410	810

Student	H.S.G.P.A.	SAT(V)	SAT(M)	SAT(TOTAL)
24.	2.75	430	480	910
25.	2.26	520	500	1020
26.	2.41	430	480	910
27.	2.85	370	540	910
28.	3.38	370	300	670
29.	4.0	630	570	1200
30.	3.5	17 (Act)		
31.	3.38	610	600	1210
32.	3.1	330	410	740
33.	3.75	510	610	1120
34.	3.75	320	240	560
35.	3.56	460	490	950
36.	3.47	300	410	710
37.	1.94	470	460	930
38.	3.5	480	540	1020
39.	3.3	20 (Act)		
40.	3.05	350	500	850
41.	4.0	560	500	1060
42.	3.45	390	430	820
43.	3.06	420	550	970
Total	135.97	16923	18303	34967
Mean	3.24	423	457	874

The data in Table 1 reveal that the Rowland Scholar students had a 3.24 grade point average on a 4 point scale suggesting superior high school performance. Careful observation of the data in Table 1 also show that the average performance of the participants on each variable of the SAT is not very low when compared to an average performance of slightly more than 450 on each variable by the national reference group.

Of the forty-five students in the program, two had answers and scores not accurate enough on the Kuder Occupational Interest Survey for valid interpretation and were therefore not included in this report. The test interpreter felt that these two participants were either not motivated to perform accurately on this inventory or they did not understand the directions for taking the inventory.

The pattern of interest for forty-three participants are presented in Table 2 and Table 3.

Table 2- Occupational Interest Patterns for Male Rowland Scholar participants who completed the Kuder Occupational Interest Survey during the summer experience.

Students (Male)	Occupational Scales Female Norms	College Major Scales Female Norms	Occupational Scales Male Norms	College Major Scales Male Norms
1.	Accountant	Bus. Ed. & Commerc	Acct.,Cert. Public	Math
2.	X-Ray Technician	Phy-Ed	Supv/Foreman Ind	Phy-Ed
3.	Computer Programer	Biological Science	Psych Ind	Air Force Cadet
4.	Dietician, Admin	Health Profession	Personnel Manager	Business Manager
5.	Counselor, Hi Sch	Phy-Ed	Counselor, Hi Sch	Phy-Ed
6.	-----	-----	-----	-----
7.	Computer Programer	Math	Engineer, Mech	Math
8.	Science Teacher,HS	Math	Math Teacher,HS	Math
9.	Interior Decorator	Bus. Ed. & Commerc	Auto Sale	Bus. & Marketing
10.	X-Ray Technician	Teacher, Catholic Sis	X-Ray Technician	PreMed/ Phar/ Dent
11.	Computer Programer	Psychology	Acct.,Cert. Public	Economics
12.	Computer Programer	Psychology	Computer Programer	Architecture
13.	Math Teacher, HS	Math	Supv/ Foreman Ind	Engineering, Chem
14.	Physical Therapist	Biological Science	Pharmaceutical Sales	Air Force Cadet
15.	Computer Programer	Bus. Ed. & Commerc	Bookstore Manager	Bus. & Marketing

Student (Male)	Occupational Scales Female Norms	College Major Scales Female Norms	Occupational Scales Male Norms	College Major Scales Male Norms
16.	Bank Clerk	Bus. Ed. & Commerc	Printer	Bus. & Marketing
17.	Science Teacher,HS	Math	Science Teacher,HS	Physical Science
18.	Dietician, Admin	Math	Podiatrist	Math
19.	Dental Assistant	Math	Pediatrician	Music & Music Ed.

The data in Table 2 show that the interest of male participants as revealed by the data under the columns entitled Occupational Scales - Male Norms and College Major - Major Norms are for the most part similar to those of persons in occupations dealing with mathematics, medicine, and engineering or to those of college students majoring in these areas. Interests in business and business-related fields are also quite evident in Table 2.

Table 3- Occupational Interest Patterns for Female Rowland Scholar participants who completed the Kuder Occupational Interest Survey during the summer experience.

Students (Female)	Occupational Scales Female Norms	College Major Scales Female Norms	Occupational Scales Male Norms	College Major Scales Male Norms
1.	Dental Ass't	Nursing	Podiatrist	Phy-Ed
2.	Nurse	Nursing	Pediatrician	Foriegn Language
3.	Nurse	Nursing	Phy. Therapist	Elementary Educ.
4.	Bank Clerk	Bus. Ed. & Commerc	Printer	Art & Art Educ.
5.	Phy. Therapist	Health Profession	Phy. Therapist	PreMed/Phar/Dent
6.	Florist	Home Economics Ed	Interior Decor	Elementary Educ.
7.	-----	-----	-----	-----
8.	Office Clerk	Bus. Ed. & Commerc	Interior Decor	Art & Art Educ.
9.	Dental Ass't	Teacher, Cath Sis	X-Ray Technician	PreMed/Phar/Dent
10.	Home Economics Teacher, College	Biological Science	Podiatrist	PreMed/Phar/Dent
11.	Dental Ass't	Biological Science	Pediatrician	Foriegn Language
12.	Accountant	Bus. Ed. & Commerc	Acct., Cert. Public	Bus. Management
13.	Psychology, Clinical	Psychology	Psychology, Clinical	Psychology
14.	Social Worker, Psychology	Gen Social Science	Social Worker, Group	Sociology
15.	Computer Programer	Bus. Ed. & Commerc	Photographer	Architecture

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Students (Female)	Occupational Scales Female Norms	College Major Scales Female Norms	Occupational Scales Male Norms	College Major Scales Male Norms
16.	Dental Ass't	Nursing	Counselor, Hi Sch	Elementary Educ.
17.	Computer Programer	Biological Science	Optometrist	Art & Art Educ.
18.	Office Clerk	Bus. Ed. & Commerc	Interior Decor	Music & Music Educ.
19.	X-Ray Technician	Teacher, Cath Sis	X-Ray Technician	Music & Music Educ.
20.	Dental Ass't	Math	Pediatrician	Music & Music Educ.
21.	Home Ec Teacher, College	Teacher, Cath Sis	Ostepath	Biological Science
22.	Phy. Therapist	Biological Science	Psychiatrist	Elementary Educ.
23.	Office Clerk	Nursing	Postal Clerk	Music & Music Ed.
24.	Dental Ass't	Nursing	Podiatrist	Elementary Educ.
25.	Dental Ass't	Nursing	X-Ray Technician	Elementary Educ.

According to Table 3, the female participants were interested in nursing, biological science and business related fields. A small number was interested in the helping professions in psychology and social work. The occupational interest areas for the females are indicated under columns labeled Occupational Scales - Female Norms and College Major Scales - Female Norms.

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THE CHANGE IN TEST SCORES AFTER EIGHT WEEKS OF INSTRUCTION IN SELECTED ACADEMIC AREAS

This section was intended to show the influence of instruction in mathematics, science, English and reading on standardized test scores of the Rowland Scholar participants. In order to determine the impact of the instruction on the performance of the students on these tests, the mean raw scores made by the students were compared before and after the eight weeks of the program. In addition, after the summer experience a comparison was made between the performance of participants taking reading/English and participants not taking reading/English to determine the influence of these courses in increasing the reading/English proficiency of youth who were low performers in these areas at entrance into the program.

Table 4 and Table 5 present pre- and post-test data made on the STEP Mathematics Basic Concepts Test and the STEP Mathematics Computation Test by Rowland Scholar Participants. The pre- and post test means of the participants were compared and their difference tested for significance.

Table 4- Scores made on the STEP Mathematics Basic Concepts Test by the Rowland Scholar participants before and after the eight week summer experience. n = 45 ; Highest Possible Score = 50

Student	Raw Score 1st Testing	Raw Score 2nd Testing	Difference 1st & 2nd	%-ile Score 1st Testing	%-ile Score 2nd Testing	Difference 1st & 2nd
1.	8	20	+12	1	25	+24
2.	42	36	-8	89	81	- 7
3.	16	23	+7	4	38	+34
4.	26	25	-1	31	45	+12
5.	35	31	-4	70	66	- 4
6.	33	35	+2	70	78	+ 8
7.	24	20	-4	36	25	-11
8.	27	31	+4	41	66	+25
9.	34	30	-4	65	63	- 2
10.	24	28	+4	36	57	+21
11.	30	31	+1	59	66	+ 5
12.	29	30	+1	43	63	+20
13.	22	15	-7	10	8	- 2
14.	4	13	+9	1	5	+ 4
15.	21	25	+4	20	45	+25
16.	20	23	+3	20	38	+18
17.	15	17	+2	7	14	+ 7
18.	23	20	-3	31	25	- 6
19.	33	43	+10	68	96	+28
20.	18	26	+8	13	49	+36
21.	32	32	0	68	70	+ 2
22.	18	27	+9	23	52	+29
23.	24	24	0	36	41	+ 5
24.	27	18	-9	47	18	-29
25.	29	24	-5	54	41	-13
26.	23	35	+12	31	78	+47
27.	41	38	-3	80	86	+ 6
28.	30	38	+8	59	86	+27
29.	19	19	0	16	21	+ 5
30.	44	43	-1	94	96	+ 2
31.	21	15	-6	23	8	-15
32.	40	42	+2	86	94	+ 8

Student	Raw Score 1st Testing	Raw Score 2nd Testing	Difference 1st & 2nd	%-ile Score 1st Testing	%-ile Score 2nd Testing	Difference 1st & 2nd
33.	29	28	-1	54	57	+3
34.	23	22	-1	49	33	+8
35.	30	28	-2	61	57	-4
36.	26	15	-9	43	8	-35
37.	19	18	-1	16	18	-2
38.	27	27	0	47	52	+5
39.	29	33	+4	54	72	+18
40.	32	21	-11	54	28	-26
41.	20	17	-3	20	14	-7
42.	25	30	+5	41	63	+22
43.	30	17	-13	61	14	-47
44.	30	28	-1	54	57	+3
45.	35	35	+1	61	78	+17
Total	1186	1196				
Mean	26.36	26.58				
SD	8.06	7.29				

According to Table 4, the Rowland Scholar participants increased their total raw score of 1186 on the first testing to a total raw score of 1196 on the second testing. This increase appeared to indicate a definite positive influence of the program on mathematics basic concepts. Statistically, however, the difference was not significant. Careful observation of the data in Table 4 also suggests significant change for some individuals in both raw and percentile scores.

Table 5- Scores made on the STEP Mathematics Computation Test by the Rowland Scholar participants before and after the eight week summer experience.
n = 45 ; Highest Possible Score = 60

Student	Raw Score 1st Testing	Raw Score 2nd Testing	Difference 1st & 2nd	%-ile Score 1st Testing	%-ile Score 2nd Testing	Difference 1st & 2nd
1.	15	22	+7	2	10	+8
2.	49	57	+8	80	93	+13
3.	21	17	-4	9	4	-5
4.	42	38	-4	62	51	-9
5.	40	40	0	56	56	0
6.	43	47	+4	62	75	+13
7.	28	35	+7	23	43	+20
8.	35	38	+3	39	51	+12
9.	47	50	+3	77	80	+3
10.	50	52	+2	82	84	+2
11.	44	49	+5	64	78	+6
12.	42	45	+3	64	69	+5
13.	26	27	+1	20	20	0
14.	6	6	0	1	1	0
15.	34	34	0	39	41	+2
16.	27	40	+13	23	56	+16
17.	31	6	-26	34	1	-33
18.	35	36	+1	43	46	+3
19.	55	57	+2	91	93	+2
20.	26	25	-1	20	15	-5
21.	52	51	-1	85	82	-3
22.	35	42	+7	48	62	+14
23.	30	47	+17	30	75	+45
24.	31	39	+8	34	54	+20
25.	31	36	+5	34	46	+12
26.	31	37	+6	34	49	+15
27.	48	50	+2	78	80	+2
28.	41	48	+7	62	77	+15
29.	28	32	+4	25	34	+11
30.	51	56	+5	82	91	+9
31.	21	27	+6	21	20	-1
32.	59	58	-1	98	95	-3

Student	Raw Score 1st Testing	Raw Score 2nd Testing	Difference 1st & 2nd	%-ile Score 1st Testing	%-ile Score 2nd Testing	Difference 1st & 2nd
33.	33	40	+7	39	56	+17
34.	32	40	+8	39	56	+17
35.	43	43	0	69	64	-3
36.	27	18	-9	20	5	-15
37.	24	36	+12	16	46	+30
38.	34	37	+3	43	49	+6
39.	43	42	-1	69	62	-7
40.	47	37	-10	77	49	-28
41.	33	35	+2	34	43	+9
42.	32	39	+7	39	54	+15
43.	28	42	+14	25	62	+37
44.	40	29	-11	58	26	-32
45.	36	48	+10	52	77	+25
Total	1608	1730				
Mean	35.73	38.44				
SD	10.69	11.92				

The data in Table 5 indicate that the participants total score was 122 points higher on the second testing than on the first testing. The mean increase which was 2.71, was found to be not significant. However, the change in a positive direction seems to indicate that students can be helped to improve their skills in mathematics over a short period of time. The data in both Table 4 and Table 5 suggest that the majority of the individual participants increased their scores on the second testing. However, a few had scores higher on the first testing than on the second testing.

The improvement made in the STEP Science Test scores by the Rowland Scholar participants appear in Table 6.

Table 6- Scores made on the STEP Science Test by Rowland Scholar participants before and after the eight week summer experience.

n = 45 ; Highest Possible Score = 75

Student	Raw Score 1st Testing	Raw Score 2nd Testing	Difference 1st & 2nd	%-ile Score 1st Testing	%-ile Score 2nd Testing	Difference 1st & 2nd
1.	22	36	+14	7	44	+37
2.	44	38	- 6	71	52	-19
3.	26	32	+ 2	15	31	+16
4.	33	35	+ 2	31	42	+11
5.	23	32	+ 9	15	31	+16
6.	40	39	- 1	59	55	- 4
7.	45	36	- 9	74	44	-30
8.	40	52	+12	55	89	+34
9.	38	41	+ 3	52	63	+11
10.	27	34	+ 7	13	39	+26
11.	27	30	+ 3	15	24	+ 9
12.	30	33	+ 3	31	34	+ 3
13.	23	32	+ 9	10	31	+21
14.	14	27	+13	1	18	+17
15.	16	24	+ 8	1	12	+11
16.	31	32	- 1	26	31	+ 7
17.	26	35	+ 9	15	42	+27
18.	21	45	+24	6	74	+68
19.	36	43	+ 7	44	69	+25
20.	24	24	0	10	12	+ 2
21.	45	42	- 3	74	68	- 8
22.	37	41	+ 4	49	63	+14
23.	24	31	+ 7	9	29	+20
24.	45	31	-14	74	29	-45
25.	33	31	- 2	31	29	- 2
26.	47	45	- 2	79	74	- 5
27.	41	41	0	59	63	+ 4
28.	49	49	0	85	85	0
29.	26	25	- 1	15	13	- 2
30.	53	55	+ 2	91	93	+ 2
31.	30	28	- 2	19	20	- 1
32.	58	53	- 5	96	91	- 5

Student	Raw Score 1st Testing	Raw Score 2nd Testing	Difference 1st & 2nd	%-ile Score 1st Testing	%-ile Score 2nd Testing	Difference 1st & 2nd
33.	31	44	+13	26	71	+45
34.	31	31	0	26	29	+ 3
35.	25	27	+ 2	13	18	+ 5
36.	31	36	+ 5	36	44	+18
37.	31	25	- 6	26	13	-13
38.	33	26	- 7	34	15	-19
39.	35	35	0	42	42	0
40.	51	50	- 1	89	85	- 4
41.	38	45	+ 7	52	74	+22
42.	27	36	+ 9	18	44	+26
43.	37	24	-13	49	12	-37
44.	32	31	- 1	31	29	- 2
45.	33	52	+19	42	89	+47
Total	1509	1634				
Mean	33.53	36.31				
SD	9.70	8.49				

Table 6 shows that at the end of the eight weeks allotted for the program the total test score for the participants had changed 125 points. The mean difference between the first and second administration of the test was only 2.78. This difference between the two means was not statistically significant. Although not significant, the positive change made in the science test scores, like the change made in the mathematics test scores, implies that intensive instruction over a short period of time can help students improve their academic skills.

To determine the impact of the reading and English instruction in improving the reading and English skills of a selected number of the participants who were poorest in the two areas as indicated by scores made on the reading and English standardized tests, the mean increase in test scores in the two areas by students receiving English/reading instruction was statistically compared before and after the eight weeks of the program.

Table 7 and Table 8 present pre- and post-test data made on the Iowa Silent Reading Tests by the subjects not taking the reading experience during the summer experience. Table 7 shows change in raw scores made on the tests and Table 8 presents change in percentile scores for the group not taking the reading course.

Table 7- Pre and Post Testing Raw Scores made on the Iowa Silent Reading Tests by Rowland Scholar participants not taking the Reading course during the summer experience.

n = 27

Test 1 = Vocabulary Section; Test 2 = Comprehension Section; Test 3 = Reading Efficiency (speed)

Student	Raw Score 1st Testing Test 1 & Test 2	Raw Score 2nd Testing Test 1 & Test 2	Difference 1st & 2nd	Raw Score 1st Testing Test 3	Raw Score 2nd Testing Test 3	Difference 1st & 2nd
1.	68	74	+6	27	25	-2
2.	61	64	+5	16	23	+7
3.	43	46	+3	18	20	+2
4.	68	70	+2	22	26	+4
5.	45	60	+15	20	35	+15
6.	44	63	+19	21	24	+3
7.	48	57	+9	19	20	+1
8.	57	68	+9	18	29	+11
9.	68	75	+7	14	27	+13
10.	57	59	+2	17	27	+10
11.	70	76	+6	30	32	+2
12.	58	64	+6	23	29	+6
13.	67	57	-10	28	23	-5
14.	69	68	-1	26	39	+13
15.	36	64	+28	29	30	+1
16.	57	67	+10	22	31	+9
17.	93	91	-2	30	30	0
18.	47	55	+8	20	28	+8
19.	76	82	+6	27	37	+10
20.	55	46	-9	21	26	+5
21.	51	57	+6	18	20	+2
22.	73	74	+1	19	27	+8
23.	66	68	+2	26	29	+3
24.	60	70	+10	20	35	+15
25.	43	53	+10	14	19	+5
26.	72	69	-3	28	26	-2
27.	51	58	+7	21	28	+7

Student	Raw Score 1st Testing Test 1 & Test 2	Raw Score 2nd Testing Test 1 & Test 2	Difference 1st & 2nd	Raw Score 1st Testing Test 3	Raw Score 2nd Testing Test 3	Difference 1st & 2nd
Total	1603	1755		594	757	
Mean	59.37	65.00		22.00	28.04	
SD	12.58	11.58		4.72	5.43	

According to 7, the students not taking reading increased their total test score from 1603 on the firs testing to 1755 on the second testing on test 1 and test 2 combined, and from 594 on test 3 during the firs testing to 757 on test 3 during the second testing. The change made in the total test score for test 1 and test 2 combined and the change made in the total test score for test 3 during the eight weeks were almost significant statistically.

Table 8 shows the change made in percentile scores by the participants not taking reading.

Table 8- Pre and Post Testing Percentile Scores made on the Iowa Silent Reading Tests by Rowland Scholar participants not taking the Reading course during the summer experience.
n =27

Student	%-ile Test 1 & Test 2 1st Testing	%-ile Test 1 & Test 2 2nd Testing	Difference 1st & 2nd	%-ile Test 3 1st Testing	%-ile Test 3 2nd Testing	Difference 1st & 2nd
1.	82	89	+7	74	64	-10
2.	73	77	+4	19	52	+33
3.	42	48	+6	15	37	+22
4.	82	85	+3	46	69	+23
5.	45	72	+27	37	95	+58
6.	41	76	+35	42	58	+16
7.	51	66	+15	32	37	+5
8.	66	82	+16	27	82	+55
9.	82	90	+8	13	73	+61
10.	66	69	+3	45	74	+29
11.	85	91	+6	86	90	+4
12.	67	77	+1-	58	82	+24
13.	80	66	-14	78	52	-26
14.	83	82	-1	69	99	+30
15.	83	77	-6	82	86	+4
16.	66	80	+14	46	88	+42
17.	99	99	0	86	86	0
18.	50	63	+13	37	78	+41
19.	91	95	+4	74	97	+23
20.	63	48	-15	42	69	+27
21.	56	66	+10	27	37	+10
22.	88	89	+1	32	74	+42
23.	79	82	+3	69	82	+13
24.	72	85	+13	37	95	+58
25.	42	60	+18	13	32	+19
26.	87	83	-4	78	98	+20
27.	56	67	+11	42	78	+36

Table 9 and Table 10 present test scores made on the Iowa Silent Reading Tests by the participants placed in the reading course.

significant statistically. However, the difference of 7.11 found between the means for test 3 was highly significant at the one per cent level of confidence.

Table 10 reveals the changes in percentile rank made by the Rowland Scholar participants taking reading during the eight-week program. It should be noted that the overwhelming majority of the participants changed positively in percentile rank on this test.

Table 10- Pre- and Post Testing Percentiles Scores made on the Iowa Silent Reading Tests by Rowland Scholar participants taking the reading course during the summer experience.
n = 18

Student	%-ile Test 1 & Test 2 1st Testing	%-ile Test 1 & Test 2 2nd Testing	Difference 1st & 2nd	%-ile Test 3 1st Testing	%-ile Test 3 2nd Testing	Difference 1st & 2nd
1.	4	37	+33	13	37	+24
2.	25	44	+19	8	6	-2
3.	50	67	+17	52	78	+26
4.	42	67	+25	32	88	+56
5.	48	59	+11	46	78	+32
6.	37	59	+22	32	42	+10
7.	16	4	-12	8	32	+24
8.	18	6	-12	13	64	+51
9.	35	44	+11	19	42	+23
10.	10	44	+34	5	23	+18
11.	18	53	+33	16	42	+26
12.	27	44	+17	69	46	-23
13.	33	37	+ 4	86	52	-34
14.	35	62	+17	4	37	+33
15.	25	29	+ 5	6	32	+26
16.	25	6	-19	13	46	+33
17.	20	33	+13	13	42	+29
18.	20	69	+49	17	58	+41

The difference between the mean scores made on Test 1 and Test 2 combined of the Iowa Silent Reading Tests by the participants taking reading and the participants not taking reading during the summer program are presented in Table 11.

Table 11- Mean Differences of Pre and Post Testing Raw Scores made on the Iowa Silent Reading Tests by Rowland Scholar participants taking reading and Rowland Scholar participants not taking reading during the summer experience.

Group	Mean Score 1st Testing	Mean Score 2nd Testing	Mean Difference 1st & 2nd
Taking Reading (n = 18)	36	44	8
Not Taking Reading (n = 27)	59	65	6
Mean Difference	23	21	2

The data in Table 11 show that the mean score for the participants taking reading changed to a greater extent than the mean score for the participants not taking reading during the eight weeks allotted for the program. However, neither group changed its mean significantly on the second testing from what it was on the first testing.

An attempt was made to determine the influence instruction in English had on the scores made on the California Language Test by the participants taking the English course. Presented in Table 12 are scores made on the California Language Tests by the students receiving instruction in English before and after the summer program.

Table 12- Pre- and Post Testing Scores made on the California Language Test by Rowland Scholar participants taking the English Course during the summer experience.

M = Mechanics; U = Usage; S = Structure n = 19

Student	Raw Score M + U & S 1st Testing	Raw Score M + U & S 2nd Testing	Difference 1st & 2nd	%-ile Score 1st Testing	%-ile Score 2nd Testing	Difference 1st & 2nd
1.	82	97	+15	27	40	+13
2.	87	101	+14	36	47	+11
3.	74	100	+26	17	45	+28
4.	86	36	-50	34	1	-33
5.	78	99	+21	22	43	+21
6.	76	81	+5	19	20	+1
7.	62	96	+34	8	38	+30
8.	66	101	+35	9	47	+38
9.	84	103	+19	30	51	+21
10.	81	112	+31	26	73	+47
11.	80	83	+3	24	21	-3
12.	84	97	+13	30	40	+10
13.	75	92	+17	18	32	+14
14.	82	87	+5	27	25	-2
15.	83	109	+26	29	66	+37
16.	71	99	+28	14	43	+29
17.	81	92	+11	26	32	+6
18.	91	94	+3	44	35	-9
19.	88	90	+2	38	29	-9
Total	1511	1769	+258			
Mean	79	93	+14			
SD	7.25	15.47				

According to Table 12, the students taking the English course changed their mean in a positive direction by fourteen points. This change was highly significant at the .01 level of confidence.

Table 13- Pre- and Post Testing Scores made on the California Language Test by Rowland Scholar participants not taking the English course during the summer experience.

M = Mechanics; U = Usage; S = Structure n = 26

Student	Raw Score M + U & S 1st Testing	Raw Score M + U & S 2nd Testing	Difference 1st & 2nd	%-ile Score 1st Testing	%-ile Score 2nd Testing	Difference 1st & 2nd
1.	103	116	+13	73	83	+10
2.	95	109	+14	55	66	+11
3.	96	107	+11	56	61	+5
4.	91	100	+9	44	45	+1
5.	104	116	+12	76	83	+7
6.	100	120	+20	66	91	+25
7.	108	120	+12	84	91	+7
8.	105	93	-12	78	33	-45
9.	98	103	+5	61	51	-10
10.	98	109	+11	61	66	+5
11.	99	101	+2	63	47	-16
12.	92	93	+1	98	33	-65
13.	98	96	-2	61	38	-23
14.	92	90	-2	46	29	-17
15.	104	101	-3	76	47	-29
16.	123	126	+3	99	98	-1
17.	93	101	+8	49	47	+2
18.	105	108	+3	78	68	-10
19.	94	109	+15	51	66	+15
20.	94	99	+5	51	43	-8
21.	96	95	-1	56	36	-20
22.	106	106	0	80	58	-22
23.	99	103	+4	63	51	-12
24.	106	106	0	80	58	-22
25.	100	107	+7	66	61	-5
26.	108	118	+10	84	87	+3
Total	2607	2752	+145			
Mean	100	106	6	t = 1.20		
SD	6.85	9.12	9.1			

In Table 13, a "t" test was applied to the mean difference of six points. A "t" of 1.20 was obtained, which was not enough to reach the 5 percent level of confidence. Thus the Rowland Scholar participants not taking English appeared to remain statically at the same level in English proficiency throughout the eight weeks of the program.

The scores for the group of students taking English and the group of students not taking English were summarized and are shown in Table 14.

Table 14- Mean Differences of Pre- and Post Testing Raw Scores made on the California Language Tests by Rowland Scholar participants taking the English course and Rowland Scholar participants not taking the English course during the summer experience.

Group	Mean Score 1st Testing	Mean Score 2nd Testing	Mean Difference 1st & 2nd
Taking English (n = 19)	79	93	14
Not Taking English (n = 26)	100	106	6
Mean Difference	21	13	8

Table 14 shows that there was a difference of eight points in the mean change made by the participants taking English and the mean change made by the participants not taking English. The group taking English increased their mean by fourteen points as compared to six points for the group not taking English.

The strengths and weaknesses of the Rowland Scholar participants in various aspects of mathematics are presented in Table 15 and Table 16.

Table 15- STEP Mathematics Basic Concepts Test Group Item Summary Data for Rowland Scholar participants before and after the eight week summer experience.

n = 45

Content Categories	Number of Omits and/or Incorrect Responces 1st Testing	Number of Omits and/or Incorrect Responces 2nd Testing	% Responding Correctly 1st Testing	% Responding Correctly 2nd Testing
Recall Facts/ Perform Mathematics Manipulation				
Number Operation (6)	111	71	59	69
Geometry, Measurement, Logic, Proof (4)	102	76	43	44
Algebraic Relations (6)	95	98	65	69
Demonstrate Comprehension of Mathematics Concepts				
Number Operations (4)	78	82	57	55
Geometry, Measurement, Logic, Proof (5)	126	111	44	40
Algebraic Relations (3)	44	114	68	47
Applications (6)	147	50	46	83
Probability Statistics (14)	334	227	47	58
Exercise Ingenuity				
Number Operations (2)	27	56	70	60
Total	1064	931		
Mean	23.64	20.68		
% of Omits and/or Incorrect Responces	47	39		
Number of Items in Test	50	53		

Presented in Table 15 are data dealing with the students' ability (1) to recall facts and/or perform mathematical manipulation, (2) to demonstrate comprehension of mathematical concepts, and (3) to exercise ingenuity or higher mental processes. The mathematical content listed under each of the ability categories include (1) number operation; (2) geometry, measurement, logic, and proof; (3) algebraic relations, sets, equations and inequalities; (4) application; and (5) probability statistics. It should be noted that the number in parenthesis beside each content category represents the number of items in the test dealing with that content category. For example, the six to the right of number operation listed under "Recall Facts/Perform Mathematical Manipulation" represents six items in the test dealing with number operation. The number of items listed for the content category are for the items in the test form used during the first testing. The number of items often increased or decreased in number in the test form administered to the participants during the second testing; however, these are not presented in Table 15, Table 16, or Table 17. In interpreting the data in Table 15, it should be noted that the lower the percentage of students responding correctly to items in a content category the weaker the students are in mathematics dealing with that category. Thus, looking through the data under "% Responding Correctly" during the first testing, we find that the students were weakest in geometry, measurement and logic listed under the ability area "Recall Facts/Perform Mathematical Operation" and strongest in the content area number operation listed under the ability area "Exercise Ingenuity." The data in Table 15 also show that 47 percent of the students responded incorrectly to the fifty items in the test during the first testing and 39 percent responded incorrectly to the fifty-three items in the test during the second testing.

Table 16- STEP Mathematics Computation Test Data for Rowland Scholar participants before and after the eight week summer experience.

n = 45

Content Categories	Number of Omits and/or Incorrect Responses 1st Testing	Number of Omits and/or Incorrect Responses 2nd Testing	% Responding Correctly 1st Testing	% Responding Correctly 2nd Testing
Operations Involving				
Whole Numbers (7)	41	119	87	72
Fractions (14)	225	190	62	66
Decimals and Percents (22)	457	390	54	54
Denominate Numbers (6)	137	87	49	54
Algebraic Manipulations (11)	232	283	53	62
Total	1092	1069		
Mean	24.26	22.74		
% of Omits/Incorrect Responses to all items in test	40.43	38.00		
Number of items in test	60	60		

The data in Table 16 and in Table 17 can be interpreted in the same manner in which the data in Table 15 were interpreted. It is noted again here that the lower the percentage of students responding correctly to the content category the weaker the students' performances in that content area.

Content Categories	Number of Omits and/or Incorrect Responces 1st Testing	Number of Omits and/or Incorrect Responces 2nd Testing	% Responding Correctly 1st Testing	% Responding Correctly 2nd Testing
Total	1864	1768		
Mean	41.42	39.29		
% of Omits and/or Incorrect Responces to all items	55.22	51.70		

Table 17- STEP Science Test Group Item Summary for Rowland Scholar participants before and after the eight week summer experience.

n = 45

Content Categories	Number of Omits and/or Incorrect Responces 1st Testing	Number of Omits and/or Incorrect Responces 2nd Testing	% Responding Correctly 1st Testing	% Responding Correctly 2nd Testing
Knowledge				
Biology (9)	209	126	48	47
Chemistry (2)	50	53	44	59
Physics (1)	19	19	48	42
Earth Science (1)	24	72	47	53
Comprehension				
Biology (7)	112	193	65	47
Chemistry (2)	43	98	52	55
Physics (6)	154	96	43	53
Earth Science (4)	101	26	44	58
Application				
Biology (11)	312	225	37	45
Chemistry (11)	317	215	36	53
Physics (11)	296	247	40	55
Earth Science (4)	92	223	49	62
Higher Abilities				
Biology (3)	54	88	60	49
Chemistry (0)				
Physics (1)	28	87	38	64
Earth Science (2)	51	0	43	0

Content Categories	Number of Omits and/or Incorrect Responces 1st Testing	Number of Omits and/or Incorrect Responces 2nd Testing	% Responding Correctly 1st Testing	% Responding Correctly 2nd Testing
Total	1864	1768		
Mean	41.42	39.29		
% of Omits and/or Incorrect Responces to all items	55.22	51.70		

FACTORS RELATING TO THE PERCEIVED PROBLEMS OF THE ROWLAND SCHOLAR PARTICIPANTS

A major objective of the eight-week Rowland Scholar Program was to enable the participants to recognize personal adjustment problems as they perceived them at entrance into the program. An effort was made to discuss with each participant his/her perceived problems during the eight-week session.

As previously stated, the problems of the forty-five participants were obtained through the use of the Mooney Problem Check List. This check list is a self report type instrument which contains a number of items to which the individual checks the items which expresses something that is a problem for him.

An analysis was made of the responses to the Mooney Problem Check List to determine the number of problems of the youth in the program. An effort was also made to determine whether or not there was a significant change in the number of perceived problems after the participants had received the session of score interpretation and personal counseling as well as had been involved in the other phases of the program.

Table 18 presents pre- and post checkings of problems in the Mooney Problem Check List.

Table 18- Total number of problems checked in the Mooney Problem Check List by the Rowland Scholar participants before and after the summer experience.

n = 45

Student	Total Score 1st Checking	Total Score 2nd Checking	Difference 1st & 2nd
1.	1	18	+17
2.	4	6	+2
3.	1	3	+2
4.	31	3	-28
5.	4	7	+3
6.	9	5	-4
7.	28	20	-8
8.	5	2	-3
9.	12	17	+5
10.	95	19	-76
11.	23	9	-14
12.	30	15	-15
13.	12	21	+9
14.	54	63	+9
15.	41	24	-17
16.	8	18	+10
17.	5	3	-2
18.	16	0	-16
19.	6	12	+6
20.	36	16	-20
21.	11	2	-9
22.	10	8	-2
23.	29	17	-12
24.	6	0	-6
25.	40	11	-29
26.	1	1	0
27.	4	9	+5
28.	17	5	-12
29.	44	8	-36
30.	79	5	-74
31.	10	16	+6
32.	72	39	33
33.	39	26	-13
34.	39	12	-27
35.	14	16	+2
36.	8	0	-8
37.	34	24	-10
38.	87	20	-67
39.	40	24	-16
40.	24	4	-20
41.	4	1	3
42.	73	26	-47
43.	76	29	-47
44.	6	4	-2
45.	11	4	-7

Student	Total Score 1st Checking	Total Score 2nd Checking	Difference 1st & 2nd
Total	1199	592	
Mean	26.64	13.16	
SD	25.34	11.91	

According to Table 18, the mean number of problems indicated by the students decreased from 26.64 to 13.16 during the eight weeks. This change was found to be significant at the .01 level.

The performance of the Rowland Scholar participants on the Undergraduate Record Examination Area Tests is presented in Table 19.

Table 19- Rowland Scholar participants' performance on the Area Tests of the Undergraduate Program for Counseling and Evaluation.

Student	Social Science	Humanities	Natural Science
1.	280	330	340
2.	370	390	410
3.	310	370	370
4.	290	340	370
5.	300	270	330
6.	290	360	420
7.	300	400	420
8.	270	310	520
9.	280	350	380
10.	290	350	410
11.	360	350	350
12.	390	310	350
13.	350	320	270
14.	260	310	280
15.	240	340	360
16.	350	350	370
17.	270	330	320
18.	320	320	400
19.	330	370	450
20.	340	310	320
21.	400	340	390
22.	290	340	400
23	260	340	340
24.	280	300	410
25.	360	360	540
26.	350	370	460
27.	270	360	470
28.	270	320	330
29.	470	520	510
30.	360	310	340
31.	560	410	520
32.	320	320	420

Student	Social Science	Humanities	Natural Science
33.	340	370	400
34.	250	330	400
35.	290	330	330
36.	290	360	370
37.	280	310	340
38.	330	420	420
39.	380	440	430
40.	330	340	370
41.	250	330	310
42.	370	330	420
43.	250	330	390
44.	400	360	440
45.	280	330	420
Mean (Rowland Scholars)	320	348	389
Mean (National Reference Group)	389	421	434
Difference	69	73	45

According to Table 19, the Rowland Scholar participants performed best when compared to the reference group in the natural science area and poorest in the humanities area. Scoring highest in the natural sciences is to be expected since the majority of these students are future scientists.

Student	Social Science	Humanities	Natural Science
33.	340	370	400
34.	250	330	400
35.	290	330	330
36.	290	360	370
37.	280	310	340
38.	330	420	420
39.	380	440	430
40.	330	340	370
41.	250	330	310
42.	370	330	420
43.	250	330	390
44.	400	360	440
45.	280	330	420
Mean (Rowland Scholars)	320	348	389
Mean (National Reference Group)	389	421	434
Difference	69	73	45

According to Table 19, the Rowland Scholar participants performed best when compared to the reference group in the natural science area and poorest in the humanities area. Scoring highest in the natural sciences is to be expected since the majority of these students are future scientists.

CONCLUSIONS

Statistical analysis of the test data gathered on the Rowland Scholar participants suggests the following conclusions:

1. The majority of the Rowland Scholar participants were superior in performance on traditional standardized tests to other Clark College freshman students.

2. Almost all of the participants in the program increased their test scores in reading and English during the eight weeks allotted for the academic experience. This was true for both the group taking the two courses and the group not taking these courses suggesting that the experience provided by the total program had considerable impact on reading and English skills as they are represented in the tests taken by the participants.

3. Although a majority of the participants increased their scores in the area of English, the participants taking the English course improved their performance to a much higher degree than the participants not taking the English course.

4. There was no statistically significant difference between the pre- and post test performance of the participants on the majority of the standardized tests administered to them. Though this was the case statistically speaking, the participants for the most part, seemed greatly influenced by the rich academic environment in which they were exposed during the eight-week session.

5. The perceived problems of the Rowland Scholar participants decreased significantly during the eight-week program. This appeared to suggest that many problems of young people can be reduced through the use of one counseling interview.

6. A large number of the male participants' vocational interest patterns indicated a desire to enter fields dealing with medicine, mathematics and engineering. The females appeared to have interest patterns suggesting a desire to enter such fields as nursing, business and the social services.

1976 Rowland Scholar Participants

NAME	High School
1. Adams, Mary (F) 336 Addington Street Atlanta, Ga. 30310	1. H. M. Turner High 98 Anderson Avenue Atlanta, Ga. 30314
2. Brown, Louis (M) 7649 S. Yates Boulevard Chicago, IL. 60649	2. Lindblon Technical High 6130 S. Wolcott Chicago, Il. 60636
3. Carlton, Tonya (F) 1491 Eason Street, N.W. Atlanta, Ga. 30314	3. H. M. Turner High 98 Anderson Avenue Atlanta, Ga. 30314
4. Carrington, Cheryl (F) 1803 Savannah Road Augusta, Ga. 30901	4. T. W. Josey High 1701 15th Street Augusta, Ga. 30901
5. Davis, Tanya (F) 4330 Bakers Ferry Road, S.W. Atlanta, Ga. 30331	5. Northside High 2875 Northside Drive, N.W. Atlanta, Ga.
6. Dean, Scott (M) 2875 Pharr Road, N.E. Atlanta, Ga. 30317	6. Murphy High School 256 Clifton Street, S.E. Atlanta, Ga. 30307
7. Dixon, Denise S. (F) 103 Magazine Street Hammond, La. 70401	7. Hammond High 900 Columbus Drive Hammond, La.
8. Evans, Gary L. (M) 32 Sherman Street Medford, Mass. 02155	8. Medford High 489 Winthrop Street Medford, Mass.
9. Flowers, Jimmy (M) 2531 Brentwood Court Decatur, Ga.	9. J. C. Murphy High 256 Clifton Street, S.E. Atlanta, Ga. 30307
10. Ford, Evelyn S. (F) 102 Carver Street Alexander City, Al. 35010	10. Benjamin Russell Alexander City, Al. 35010
11. Harper, Gary T. (M) 80 Chestnut Street, N.W. #256 Atlanta, Ga. 30314	11. Booker T. Washington High 45 Whitehouse Drive Atlanta, Ga.
12. Hill, Lois E. (F) P. O. Box 52 Jeffersonville, Ga. 31044	12. Twiggs County High P. O. Box 194 Jeffersonville, Ga. 31044
13. Hutchinson, Deborah V. (F) 1008 Glennwood Avenue, S.E. Atlanta, Ga. 30316	13. Roosevelt High 745 Rosalia Street, S.E. Atlanta, Ga. 30312

	Name	High School
14.	Irving, Walter F. (M) 19 Brandon Avenue Dorchester, Mass.	The English High School 77 Avenue Louis Pasteur Boston, Mass. 02115
15.	Jackson, Gwendolyn Y. (F) 2195 Whites Mill Road Decatur, Ga. 30032	Booker T. Washington High 45 Whitehouse Drive, N.W. Atlanta, Ga.
16.	Lewis, Dorris (F) 5552 Eisenhower Drive Fort Worth, Texas 76112	Dunbar High Fort Worth, Texas
17.	Lord, Renay D. (F) 150 Northampton Street Boston, Mass. 02118	Brighton High 25 Warren Street Boston, Mass.
18.	Lundy, Philip W. (M) 4715 Erato Street New Orleans, La. 70125	Booker T. Washington Senior High 1201 S. Roman Street New Orleans, La.
19.	Marrero, Jose (M) Carola E-7 Royal Garden Bayamon, Puerto Rico 00619	Dr. Agustin Stahl Parque Street Bayamon, Puerto Rico 00619
20.	Matthews, Vamell J. (F) 1180 Dolphin Drive, S.W. Atlanta, Ga. 30311	Southwest High 3116 Sewell Road Atlanta, Ga.
21.	McCoy, Wayne D. (M) 4023 Palmwood Drive Los Angeles, Cal. 90008	Fairfax High 7850 Melrose Avenue Los Angeles, Cal. 90046
22.	McQueen, Sharon (F) 3700 9th Street, S.E.#922 Washington, D. C. 20032	Academy of Notre Dame North Capital & K Street, N.E. Washington, D. C. 20002
23.	Mitchell, Ruby (F) 2841 Argyle Drive, N.W. Atlanta, Ga. 30318	Archer High 2250 Perry Boulevard Atlanta, Ga. 30318
24.	Morrissette, Curlee (M) 931 Newsom Street Prichard, Al. 36610	Mattie T. Blount 838 W. Main Street Prichard, Al. 36610
25.	Mosley, Edward F. (M) 1225 Graymont Drive, S.W. Atlanta, Ga. 30310	Southwest High 3116 Sewell Road, S.W. Atlanta, Ga. 30310
26.	Murray, Lionel (M) 4595 Sahara Drive, S.W. Atlanta, Ga. 30331	St. Joseph High 320 Courtland Street Atlanta, Ga.

	Name	High School
27.	Nared, Glenn (M) 97-04 35th Avenue Corona, New York 11368	Brooklyn Technical 29 Ft. Greene Pl. Brooklyn, New York
28.	Robinson, Gregory (M) 1498 Montague Avenue N. Charleston, S.C. 29406	Prince George High Prince George, Va. 23875
29.	Ross, Jane E. (F) 2923 Baker Ridge Drive, N.W. Atlanta, Ga. 30318	Frederick Douglass High 225 Hightower Road, N.W. Atlanta, Ga. 30318
30.	Ross, Janet L. (F) 2923 Baker Ridge Drive, N.W. Atlanta, Ga. 30318	Frederick Douglass High 225 Hightower Road, N.W. Atlanta, Ga. 30318
31.	Rushing, Sylvia (F) 454 Lott Street Mobile, Al. 36604	Williamson High 1007 Swan Drive Mobile, Al. 36605
32.	Simmons, James E. (M) 707 York Street Valdosta, Ga. 31601	Valdosta High 3101 North Forrest Valdosta, Ga. 31601
33.	Stephens, Felecia (F) 2001 Jones Road, N.W. Atlanta, Ga. 30318	Frederick Douglass 225 Hightower Road, N.W. Atlanta, Ga. 30318
34.	Thedford, Cheryl (F) 19 Mapleridge Avenue Buffalo, New York 14215	Kensington High 319 Suffolk Buffalo, New York
35.	Walker, Sheila Y. (F) 95 Stafford Street, N.W. Atlanta, Ga. 30314	Booker T. Washington High 45 Whitehouse Drive, S.W. Atlanta, Ga.
36.	Walker, Shirley V. (F) 95 Stafford Street, N.W. Atlanta, Ga. 30314	Booker T. Washington High 45 Whitehouse Drive, S.W. Atlanta, Ga.
37.	Wall, Alice (F) 114 S. Grove Avenue Rockingham, N.C. 28379	Richmond Senior High Rockingham Hwy. #1 Rockingham, N.C. 28379
38.	White, Ernest 311 Archer Street Waycross, Ga. 31501	Waycross High 700 Central Avenue Waycross, Ga.
39.	Wilburn, Elayne (F) 6 Walden Sq. Road, #204 Cambridge, Mass. 02140	Cambridge Cluster High 37 Trowbridge Street Cambridge, Mass. 02137
40.	Williams, Rodney (M) 334 Huger Street Cherow, S. C. 29520	Cherow High Cherow, S. C. 29520

	Name	High School
41.	Winchester, Paul (M) 652 Root Street Prichard, Al. 36610	Mattie T. Blount 838 W. Main Street Prichard, Al. 36610
42.	Woodard, Kimm E. (F) 2737 Boulevard Drive, S.E. Atlanta, Ga. 30317	Luther Jordon Price High 1670 Capitol Avenue, S.E. Atlanta, Ga. 30315
43.	Woody, Dorothy (F) Apt. #11 N. Grady Street Claxton, Ga. 30417	Claxton High James Street Claxton, Ga. 30417
44.	Wright, Valerie (F) 233 Wellington Street, S.W. Atlanta, Ga. 30314	H. M. Turner High 98 Anderson Avenue Atlanta, Ga.
45.	Wyatt, Alfred D. (M) 4641 Bakers Ferry Road, S.W. Atlanta, Ga. 30331	Frederick Douglass 225 Hightower Road, N.W. Atlanta, Ga. 30318

1976 Faculty and Staff

1.	Dr. John Hall	Chairman and Professor of Mathematics Mathematics
2.	Dr. Grayson Walker	Professor of Physics Computer Science
3.	Dr. Melvin Webb	Associate Professor of Biological Science Biology
4.	Dr. Isabella Finkelstein	Assistant Professor of Biology Biology
5.	Dr. Carson Lee	Professor of Psychology Testing
6.	Dr. Wendell Thompson	Assistant Professor of English Reading and English
7.	Dr. Rao Veluri	Assistant Professor of Physical Science Instrumentation
8.	Mr. Booker T. Simpson	Associate Professor of Chemistry Science and Society
9.	Dr. Om P. Puri	Chairman and Professor of Physics Science and Society
10.	Mrs. Vivien Merriweather	Secretary
11.	Miss Jennifer Harper	Program Associate and Resident Counselor
12.	Mr. James Bennett	Program Associate and Resident Counselor